This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

Claims 1-49 (Cancelled)

50. (Currently amended) An elastase-resistant antithrombin III (ATIII) comprising at least two modifications, wherein the modifications occur at positions P4 and P5 of the ATIII, wherein P4 and P5 are the fourth and fifth amino acids towards the amino terminal side of the scissile bond of the reactive center respectively, wherein P4 comprises an amino acid selected from the group consisting of alanine; phenylalanine; glycine; and proline, and wherein P5 comprises an amino acid selected from the group consisting of glutamic acid; phenylalanine; glycine; and proline, wherein the elastase-resistant ATIII is at least as resistant to elastase as plasma ATIII, wherein the ATIII retains a thrombin inhibitory activity defined by a k_{app} of at least about $0.2M^{-1}sec^{-1} \times 10^3$.

51. (Previously presented) The elastase-resistant ATIII of claim 50, wherein the ATIII further comprises three additional modifications, wherein the modifications occur at positions P6, P7, and P8 of the ATIII, wherein P6, P7, and P8 are the sixth, seventh, and eighth amino acids towards the amino terminal side of the scissile bond of the reactive center respectively, wherein P8 is glutamic acid, wherein residue P7 comprises an amino acid selected from the group consisting of glutamic acid and glutamine, and wherein P6 comprises an amino acid selected from the group consisting of: leucine; glycine; glutamic acid; and threonine.

52. (Previously presented) The elastase-resistant ATIII of claim 50 wherein the ATIII further comprises one additional modification, wherein the modification occurs at position P3 of the ATIII, wherein P3 is the third amino acid towards the amino terminal side of the scissile bond of the reactive center, and wherein P3 comprises an amino acid selected from the group consisting of isoleucine; serine; glycine; and asparagine.

53. (Currently amended) An elastase-resistant antithrombin III (ATIII) comprising at least three modifications, wherein the modifications occur at positions P4, P5, and P6 of the ATIII, wherein P4, P5, and P6 are the fourth, fifth, and sixth amino acids towards the amino terminal side of the scissile bond of the reactive center respectively, wherein P4 comprises an amino acid selected from the group consisting of alanine; phenylalanine; glycine; and proline, wherein P5 comprises an amino acid selected from the group consisting of glutamic acid; phenylalanine; glycine; and proline, and wherein P6 comprises an amino acid selected from the group consisting of leucine, glycine, glutamic acid, and threonine, wherein the elastase-resistant ATIII is at least as resistant to elastase as plasma ATIII, wherein the ATIII retains a thrombin inhibitory activity defined by a k_{app} of at least about $0.2M^{-1}S^{-1} \times 10^3$.

54. (Previously presented) The elastase-resistant ATIII of claim 53, wherein P6 is glycine.

55. (Previously presented) The elastase-resistant ATIII of claim 54, wherein P5 is phenylalanine or glutamic acid.

56. (Currently amended) An elastase-resistant antithrombin III (ATIII) comprising at least two modifications, wherein the modifications occur at positions P3 and P6 of the ATIII, wherein P3 and P6 are the third and sixth amino acids towards the amino terminal side of the scissile bond of the reactive center respectively, wherein P3 comprises an amino acid selected from the group consisting of isoleucine; serine; glycine; and asparagine, and wherein P6 comprises an amino acid selected from the group consisting of leucine; glycine; glutamic acid; and threonine, wherein the elastase-resistant ATIII is at least as resistant to elastase as plasma ATIII, wherein the ATIII retains a thrombin inhibitory activity defined by a k_{app} of at least about $0.2M^{-1}S^{-1} \times 10^3$.

57. (Previously presented) The elastase-resistant ATIII of claim 56, wherein P3 is serine.

58. (Previously presented) The elastase-resistant ATIII of claim 56, wherein P6 is glycine.

59. (Previously presented) The elastase-resistant ATIII of claim 58, wherein P3 is serine.

60. (Currently amended) An elastase-resistant antithrombin III (ATIII) comprising at least three modifications, wherein the modifications occur at positions P3, P6, and P7 of the ATIII, wherein P3, P6, and P7 are the third, sixth, and seventh amino acids towards the amino terminal side of the scissile bond of the reactive center respectively, wherein P3 comprises an

amino acid selected from the group consisting of isoleucine; serine; glycine; and asparagine, wherein P6 comprises an amino acid selected from the group consisting of leucine; glycine; glutamic acid; and threonine, and wherein P7 comprises an amino acid selected from the group consisting of glutamic acid and glutamine, wherein the elastase-resistant ATIII is at least as resistant to elastase as plasma ATIII, wherein the ATIII retains a thrombin inhibitory activity defined by a k_{app} of at least about $0.2M^{-1}S^{-1} \times 10^3$.

61. (Previously presented) The elastase-resistant ATIII of claim 60, wherein P7 is glutamic acid.

62. (Previously presented) The elastase-resistant ATIII of claim 61, wherein P3 is serine, and wherein P6 is glycine.

63. (Currently amended) An elastase-resistant antithrombin III (ATIII) comprising at least five amino acid modifications, wherein the modifications occur at positions P3, P4, P5, P6, and P7 of the ATIII, wherein P3, P4, P5, P6, and P7 are the third, fourth, fifth, sixth, and seventh amino acids towards the amino terminal side of the scissile bond of the reactive center respectively, wherein P3 is serine, wherein P4 is phenylalanine, wherein P5 is phenylalanine, wherein P6 is glycine, and wherein P7 is glutamic acid, wherein the elastase-resistant ATIII is at least as resistant to elastase as plasma ATIII, wherein the ATIII retains an antithrombin activity defined by a k_{app} of at least about $0.2M^{-1}S^{-1} \times 10^3$.

64. (Currently amended) An elastase-resistant antithrombin III (ATIII) comprising at least five amino acid modifications, wherein the modifications occur at positions P3, P4, P5, P6, and P7 of the ATIII, wherein P3, P4, P5, P6, and P7 are the third, fourth, fifth, sixth, and seventh amino acids towards the amino terminal side of the scissile bond of the reactive center respectively, wherein P3 is serine, wherein P4 is alanine, wherein P5 is glutamic acid, wherein P6 is glycine, and wherein P7 is glutamic acid, wherein the elastase-resistant ATIII is at least as resistant to elastase as plasma ATIII, wherein the ATIII retains a thrombin inhibitory activity defined by a k_{app} of at least about $0.2M^{-1}S^{-1} \times 10^3$.

65. (Currently amended) An elastase-resistant antithrombin III comprising an amino acid sequence at residues 387 through 391 of SEQ ID NO:35, wherein residues 387-391 are the sequence corresponding to residues 3 through 7 of SEQ ID NO:4, wherein the elastase-resistant ATIII is at least as resistant to elastase as plasma ATIII~~have the sequence shown at residues 3 through 7 of SEQ ID NO:4~~.

66. (Currently amended) An elastase-resistant antithrombin III comprising an amino acid sequence at residues 387 through 391 of SEQ ID NO:35, wherein residues 387-391 are the sequence corresponding to residues 3 through 7 of SEQ ID NO:5, wherein the elastase-resistant ATIII is at least as resistant to elastase as plasma ATIII ~~SEQ ID NO:4 have the sequence shown at residues 2 through 7 of SEQ ID NO:5~~.

67. (Currently amended) An elastase-resistant antithrombin III (ATIII) comprising at least two modifications, wherein the modifications occur at positions P4 and P5 of the ATIII,

wherein P4 and P5 are the fourth and fifth amino acids towards the amino terminal side of the scissile bond of the reactive center respectively, wherein P4 comprises an amino acid selected from the group consisting of alanine; glycine; and proline, and wherein P5 comprises an amino acid selected from the group consisting of glutamic acid; glycine; and proline, wherein the elastase-resistant ATIII is at least as resistant to elastase as plasma ATIII, wherein the ATIII retains a thrombin inhibitory activity defined by a k_{app} of at least about $0.2M^{-1}S^{-1} \times 10^3$.

68. (Currently amended). An elastase-resistant antithrombin III (ATIII) comprising at least three modifications, wherein the modifications occur at positions P4, P5, and P6 of the ATIII, wherein P4, P5, and P6 are the fourth, fifth, and sixth amino acids towards the amino terminal side of the scissile bond of the reactive center respectively, wherein P4 is alanine, wherein P5 is glutamic acid; and wherein P6 is leucine, wherein the elastase-resistant ATIII is at least as resistant to elastase as plasma ATIII, wherein the ATIII retains a thrombin inhibitory activity defined by a k_{app} of at least about $0.2M^{-1}S^{-1} \times 10^3$.

69. (Currently amended). An elastase-resistant antithrombin III (ATIII) comprising at least four modifications, wherein the modifications occur at positions P3, P4, P5, and P6 of the ATIII, wherein P3, P4, P5, and P6 are the third, fourth, fifth, and sixth amino acids towards the amino terminal side of the scissile bond of the reactive center respectively, wherein P3 is isoleucine, wherein P4 is alanine, wherein P5 is glutamic acid; and wherein P6 is leucine, wherein the elastase-resistant ATIII is at least as resistant to elastase as plasma ATIII, wherein the ATIII retains a thrombin inhibitory activity defined by a k_{app} of at least about $0.2M^{-1}S^{-1} \times 10^3$.

70. (Previously presented) The ATIII of claim 50, wherein the ATIII is in a pharmaceutically acceptable formulation.

71. (Previously presented) The elastase-resistant ATIII of claim 50, wherein the ATIII has enhanced heparin binding activity.

72. (Previously presented) The ATIII of claim 71, wherein the ATIII is in a pharmaceutically acceptable formulation.

73. (Previously presented) The elastase-resistant ATIII of claim 50, wherein the ATIII has enhanced heparin binding activity, and wherein the ATIII has a mutation two residues subsequent to a glycosylation site.

74. (Previously presented) The ATIII of claim 73, wherein the ATIII is in a pharmaceutically acceptable formulation.

75. (Currently amended) An elastase-resistant antithrombin III (ATIII) comprising at least two modifications, wherein the modifications occur at positions P4 and P5 of the ATIII, wherein P4 and P5 are the fourth and fifth amino acids towards the amino terminal side of the scissile bond of the reactive center respectively, wherein P4 comprises an amino acid selected from the group consisting of alanine; phenylalanine; glycine; and proline, and wherein P5 comprises an amino acid selected from the group consisting of glutamic acid; phenylalanine; glycine; and proline, wherein the elastase-resistant ATIII is at least as resistant to elastase as

plasma ATIII, wherein the ATIII retains a factor Xa inhibitory activity defined by a k_{app} of at least about $0.2M^{-1}S^{-1} \times 10^3$.

76. (Previously presented) The elastase-resistant ATIII of claim 75 wherein the ATIII further comprises three additional modifications, wherein the modifications occur at positions P6, P7, and P8 of the ATIII, wherein P6, P7, and P8 are the sixth, seventh, and eighth amino acids towards the amino terminal side of the scissile bond of the reactive center respectively, wherein P8 is glutamic acid, wherein residue P7 comprises an amino acid selected from the group consisting of glutamic acid and glutamine, and wherein P6 comprises an amino acid selected from the group consisting of: leucine; glycine; glutamic acid; and threonine.

77. (Previously presented) The elastase-resistant ATIII of claim 75 wherein the ATIII further comprises one additional modification, wherein the modification occurs at position P3 of the ATIII, wherein P3 is the third amino acid towards the amino terminal side of the scissile bond of the reactive center, and wherein P3 comprises an amino acid selected from the group consisting of isoleucine; serine; glycine; and asparagine.

78. (Currently amended) An elastase-resistant antithrombin III (ATIII) comprising at least three modifications, wherein the modifications occur at positions P4, P5, and P6 of the ATIII, wherein P4, P5, and P6 are the fourth, fifth, and sixth amino acids towards the amino terminal side of the scissile bond of the reactive center respectively, wherein P4 comprises an amino acid selected from the group consisting of alanine; phenylalanine; glycine; and proline, wherein P5 comprises an amino acid selected from the group consisting of glutamic acid;

phenylalanine; glycine; and proline, and wherein P6 comprises an amino acid selected from the group consisting of leucine, glycine, glutamic acid, and threonine, wherein the elastase-resistant ATIII is at least as resistant to elastase as plasma ATIII, wherein the ATIII retains a factor Xa inhibitory activity defined by a k_{app} of at least about $0.2M^{-1}S^{-1} \times 10^3$.

79. (Previously presented) The elastase-resistant ATIII of claim 78, wherein P6 is glycine.

80. (Previously presented) The elastase-resistant ATIII of claim 79, wherein P5 is phenylalanine or glutamic acid.

81. (Currently amended) An elastase-resistant antithrombin III (ATIII) comprising at least two modifications, wherein the modifications occur at positions P3 and P6 of the ATIII, wherein P3 and P6 are the third and sixth amino acids towards the amino terminal side of the scissile bond of the reactive center respectively, wherein P3 comprises an amino acid selected from the group consisting of isoleucine; serine; glycine; and asparagine, and wherein P6 comprises an amino acid selected from the group consisting of leucine; glycine; glutamic acid; and threonine, wherein the elastase-resistant ATIII is at least as resistant to elastase as plasma ATIII, wherein the ATIII retains a factor Xa inhibitory activity defined by a k_{app} of at least about $0.2M^{-1}S^{-1} \times 10^3$.

82. (Previously presented) The elastase-resistant ATIII of claim 81, wherein P3 is serine.

83. (Previously presented) The elastase-resistant ATIII of claim 81, wherein P6 is glycine.

84. (Previously presented) The elastase-resistant ATIII of claim 83, wherein P3 is serine.

85. (Currently amended) An elastase-resistant antithrombin III (ATIII) comprising at least three modifications, wherein the modifications occur at positions P3, P6, and P7 of the ATIII, wherein P3, P6, and P7 are the third, sixth, and seventh amino acids towards the amino terminal side of the scissile bond of the reactive center respectively, wherein P3 comprises an amino acid selected from the group consisting of isoleucine; serine; glycine; and asparagine, wherein P6 comprises an amino acid selected from the group consisting of leucine; glycine; glutamic acid; and threonine, and wherein P7 comprises an amino acid selected from the group consisting of glutamic acid and glutamine, wherein the elastase-resistant ATIII is at least as resistant to elastase as plasma ATIII, wherein the ATIII retains a factor Xa inhibitory activity defined by a k_{app} of at least about $0.2M^{-1}S^{-1} \times 10^3$.

86. (Previously presented) The elastase-resistant ATIII of claim 85, wherein P7 is glutamic acid.

87. (Previously presented) The elastase-resistant ATIII of claim 86, wherein P3 is serine, and wherein P6 is glycine.

88. (Currently amended) An elastase-resistant antithrombin III (ATIII) comprising at least five amino acid modifications, wherein the modifications occur at positions P3, P4, P5, P6, and P7 of the ATIII, wherein P3, P4, P5, P6, and P7 are the third, fourth, fifth, sixth, and seventh amino acids towards the amino terminal side of the scissile bond of the reactive center respectively, wherein P3 is serine, wherein P4 is phenylalanine, wherein P5 is phenylalanine, wherein P6 is glycine, and wherein P7 is glutamic acid, wherein the elastase-resistant ATIII is at least as resistant to elastase as plasma ATIII, wherein the ATIII retains a factor Xa inhibitory activity defined by a k_{app} of at least about $0.2M^{-1}S^{-1} \times 10^{3}$-.

89. (Currently amended) An elastase-resistant antithrombin III (ATIII) comprising at least five amino acid modifications, wherein the modifications occur at positions P3, P4, P5, P6, and P7 of the ATIII, wherein P3, P4, P5, P6, and P7 are the third, fourth, fifth, sixth, and seventh amino acids towards the amino terminal side of the scissile bond of the reactive center respectively, wherein P3 is serine, wherein P4 is alanine, wherein P5 is glutamic acid, wherein P6 is glycine, and wherein P7 is glutamic acid, wherein the elastase-resistant ATIII is at least as resistant to elastase as plasma ATIII, wherein the ATIII retains a factor Xa inhibitory activity defined by a k_{app} of at least about $0.2M^{-1}S^{-1} \times 10^{3}$.

90. (Currently amended) An elastase-resistant antithrombin III (ATIII) comprising at least two modifications, wherein the modifications occur at positions P4 and P5 of the ATIII, wherein P4 and P5 are the fourth and fifth amino acids towards the amino terminal side of the scissile bond of the reactive center respectively, wherein P4 comprises an amino acid selected

from the group consisting of alanine; glycine; and proline, and wherein P5 comprises an amino acid selected from the group consisting of glutamic acid; glycine; and proline, wherein the elastase-resistant ATIII is at least as resistant to elastase as plasma ATIII, wherein the ATIII retains a factor Xa inhibitory activity defined by a k_{app} of at least about $0.2M^{-1}S^{-1} \times 10^3$.

91. (Currently amended). An elastase-resistant antithrombin III (ATIII) comprising at least three modifications, wherein the modifications occur at positions P4, P5, and P6 of the ATIII, wherein P4, P5, and P6 are the fourth, fifth, and sixth amino acids towards the amino terminal side of the scissile bond of the reactive center respectively, wherein P4 is alanine, wherein P5 is glutamic acid; and wherein P6 is leucine, wherein the elastase-resistant ATIII is at least as resistant to elastase as plasma ATIII, wherein the ATIII retains a factor Xa inhibitory activity defined by a k_{app} of at least about $0.2M^{-1}S^{-1} \times 10^3$.

92. (Currently amended). An elastase-resistant antithrombin III (ATIII) comprising at least four modifications, wherein the modifications occur at positions P3, P4, P5, and P6 of the ATIII, wherein P3, P4, P5, and P6 are the third, fourth, fifth, and sixth amino acids towards the amino terminal side of the scissile bond of the reactive center respectively, wherein P3 is isoleucine, wherein P4 is alanine, wherein P5 is glutamic acid; and wherein P6 is leucine, wherein the elastase-resistant ATIII is at least as resistant to elastase as plasma ATIII, wherein the ATIII retains a factor Xa inhibitory activity defined by a k_{app} of at least about $0.2M^{-1}S^{-1} \times 10^3$.

93. (Previously presented) The ATIII of claim 75, wherein the ATIII is in a pharmaceutically acceptable formulation.

94. (Previously presented) The elastase-resistant ATIII of claim 75, wherein the ATIII has enhanced heparin binding activity.

95. (Previously presented) The ATIII of claim 94, wherein the ATIII is in a pharmaceutically acceptable formulation.

96. (Previously presented) The elastase-resistant ATIII of claim 75, wherein the ATIII has enhanced heparin binding activity, and wherein the ATIII has a mutation two residues subsequent to a glycosylation site.

97. (Previously presented) The ATIII of claim 98, wherein the ATIII is in a pharmaceutically acceptable formulation.

98. (Currently amended) An elastase-resistant antithrombin III (ATIII) comprising at least two modifications, wherein the modifications occur at positions P4 and P5 of the ATIII, wherein P4 and P5 are the fourth and fifth amino acids towards the amino terminal side of the scissile bond of the reactive center respectively, wherein P4 comprises an amino acid selected from the group consisting of alanine; phenylalanine; glycine; and proline, and wherein P5 comprises an amino acid selected from the group consisting of glutamic acid; phenylalanine; glycine; and proline, wherein the elastase-resistant ATIII is at least as resistant to elastase as

plasma ATIII, wherein the ATIII retains a thrombin inhibitory activity which is at least about two percent of plasma ATIII thrombin inhibitory activity.

99. (Previously presented) The elastase-resistant ATIII of claim 98 wherein the ATIII further comprises three additional modifications, wherein the modifications occur at positions P6, P7, and P8 of the ATIII, wherein P6, P7, and P8 are the sixth, seventh, and eighth amino acids towards the amino terminal side of the scissile bond of the reactive center respectively, wherein P8 is glutamic acid, wherein residue P7 comprises an amino acid selected from the group consisting of glutamic acid and glutamine, and wherein P6 comprises an amino acid selected from the group consisting of: leucine; glycine; glutamic acid; and threonine.

100. (Previously presented) The elastase-resistant ATIII of claim 98 wherein the ATIII further comprises one additional modification, wherein the modification occurs at position P3 of the ATIII, wherein P3 is the third amino acid towards the amino terminal side of the scissile bond of the reactive center , and wherein P3 comprises an amino acid selected from the group consisting of isoleucine; serine; glycine; and asparagine.

101. (Currently amended) An elastase-resistant antithrombin III (ATIII) comprising at least three modifications, wherein the modifications occur at positions P4, P5, and P6 of the ATIII, wherein P4, P5, and P6 are the fourth, fifth, and sixth amino acids towards the amino terminal side of the scissile bond of the reactive center respectively, wherein P4 comprises an amino acid selected from the group consisting of alanine; phenylalanine; glycine; and proline, wherein P5 comprises an amino acid selected from the group consisting of glutamic acid;

phenylalanine; glycine; and proline, and wherein P6 comprises an amino acid selected from the group consisting of leucine, glycine, glutamic acid, and threonine, wherein the elastase-resistant ATIII is at least as resistant to elastase as plasma ATIII, wherein the ATIII retains a thrombin inhibitory activity which is at least about two percent of plasma ATIII thrombin inhibitory activity.

102. (Previously presented) The elastase-resistant ATIII of claim 101, wherein P6 is glycine.

103. (Previously presented) The elastase-resistant ATIII of claim 102, wherein P5 is phenylalanine or glutamic acid.

104. (Currently amended) An elastase-resistant antithrombin III (ATIII) comprising at least two modifications, wherein the modifications occur at positions P3 and P6 of the ATIII, wherein P3 and P6 are the third and sixth amino acids towards the amino terminal side of the scissile bond of the reactive center respectively, wherein P3 comprises an amino acid selected from the group consisting of isoleucine; serine; glycine; and asparagine, and wherein P6 comprises an amino acid selected from the group consisting of leucine; glycine; glutamic acid; and threonine, wherein the elastase-resistant ATIII is at least as resistant to elastase as plasma ATIII, wherein the ATIII retains a thrombin inhibitory activity which is at least about two percent of plasma ATIII thrombin inhibitory activity.

105. (Previously presented) The elastase-resistant ATIII of claim 104, wherein P3 is serine.

106. (Previously presented) The elastase-resistant ATIII of claim 104, wherein P6 is glycine.

107. (Previously presented) The elastase-resistant ATIII of claim 106, wherein P3 is serine.

108. (Currently amended) An elastase-resistant antithrombin III (ATIII) comprising at least three modifications, wherein the modifications occur at positions P3, P6, and P7 of the ATIII, wherein P3, P6, and P7 are the third, sixth, and seventh amino acids towards the amino terminal side of the scissile bond of the reactive center respectively, wherein P3 comprises an amino acid selected from the group consisting of isoleucine; serine; glycine; and asparagine, wherein P6 comprises an amino acid selected from the group consisting of leucine; glycine; glutamic acid; and threonine, and wherein P7 comprises an amino acid selected from the group consisting of glutamic acid and glutamine, wherein the elastase-resistant ATIII is at least as resistant to elastase as plasma ATIII, wherein the ATIII retains a thrombin inhibitory activity which is at least about two percent of plasma ATIII thrombin inhibitory activity.

109. (Previously presented) The elastase-resistant ATIII of claim 108, wherein P7 is glutamic acid.

110. (Previously presented) The elastase-resistant ATIII of claim 109, wherein P3 is serine, and wherein P6 is glycine.

111. (Currently amended) An elastase-resistant antithrombin III (ATIII) comprising at least five amino acid modifications, wherein the modifications occur at positions P3, P4, P5, P6, and P7 of the ATIII, wherein P3, P4, P5, P6, and P7 are the third, fourth, fifth, sixth, and seventh amino acids towards the amino terminal side of the scissile bond of the reactive center respectively, wherein P3 is serine, wherein P4 is phenylalanine, wherein P5 is phenylalanine, wherein P6 is glycine, and wherein P7 is glutamic acid, wherein the elastase-resistant ATIII is at least as resistant to elastase as plasma ATIII, wherein the ATIII retains a thrombin inhibitory activity which is at least about two percent of plasma ATIII thrombin inhibitory activity.

112. (Currently amended) An elastase-resistant antithrombin III (ATIII) comprising at least five amino acid modifications, wherein the modifications occur at positions P3, P4, P5, P6, and P7 of the ATIII, wherein P3, P4, P5, P6, and P7 are the third, fourth, fifth, sixth, and seventh amino acids towards the amino terminal side of the scissile bond of the reactive center respectively, wherein P3 is serine, wherein P4 is alanine, wherein P5 is glutamic acid, wherein P6 is glycine, and wherein P7 is glutamic acid, wherein the elastase-resistant ATIII is at least as resistant to elastase as plasma ATIII, wherein the ATIII retains a thrombin inhibitory activity which is at least about two percent of plasma ATIII thrombin inhibitory activity.[.]

113. (Currently amended) An elastase-resistant antithrombin III (ATIII) comprising at least two modifications, wherein the modifications occur at positions P4 and P5 of the ATIII,

wherein P4 and P5 are the fourth and fifth amino acids towards the amino terminal side of the scissile bond of the reactive center respectively, wherein P4 comprises an amino acid selected from the group consisting of alanine; glycine; and proline, and wherein P5 comprises an amino acid selected from the group consisting of glutamic acid; glycine; and proline, wherein the elastase-resistant ATIII is at least as resistant to elastase as plasma ATIII, wherein the ATIII retains a thrombin inhibitory activity which is at least about two percent of plasma ATIII thrombin inhibitory activity.

114. (Currently amended). An elastase-resistant antithrombin III (ATIII) comprising at least three modifications, wherein the modifications occur at positions P4, P5, and P6 of the ATIII, wherein P4, P5, and P6 are the fourth, fifth, and sixth amino acids towards the amino terminal side of the scissile bond of the reactive center respectively, wherein P4 is alanine, wherein P5 is glutamic acid; and wherein P6 is leucine, wherein the elastase-resistant ATIII is at least as resistant to elastase as plasma ATIII, wherein the ATIII retains a thrombin inhibitory activity which is at least about two percent of plasma ATIII thrombin inhibitory activity.

115. (Currently amended). An elastase-resistant antithrombin III (ATIII) comprising at least four modifications, wherein the modifications occur at positions P3, P4, P5, and P6 of the ATIII, wherein P3, P4, P5, and P6 are the third, fourth, fifth, and sixth amino acids towards the amino terminal side of the scissile bond of the reactive center respectively, wherein P3 is isoleucine, wherein P4 is alanine, wherein P5 is glutamic acid; and wherein P6 is leucine, wherein the elastase-resistant ATIII is at least as resistant to elastase as plasma ATIII, wherein

the ATIII retains a thrombin inhibitory activity which is at least about two percent of plasma ATIII thrombin inhibitory activity.

116. (Previously presented)The ATIII of claim 98, wherein the ATIII is in a pharmaceutically acceptable formulation.

117. (Previously presented) The elastase-resistant ATIII of claim 98, wherein the ATIII has enhanced heparin binding activity.

118. (Previously presented) The ATIII of claim 117, wherein the ATIII is in a pharmaceutically acceptable formulation.

119. (Previously presented) The elastase-resistant ATIII of claim 98, wherein the ATIII has enhanced heparin binding activity, and wherein the ATIII has a mutation two residues subsequent to a glycosylation site.

120. (Previously presented) The ATIII of claim 119, wherein the ATIII is in a pharmaceutically acceptable formulation.

121. (Currently amended) An elastase-resistant antithrombin III (ATIII) comprising at least two modifications, wherein the modifications occur at positions P4 and P5 of the ATIII, wherein P4 and P5 are the fourth and fifth amino acids towards the amino terminal side of the scissile bond of the reactive center respectively, wherein P4 comprises an amino acid selected from the group consisting of alanine; phenylalanine; glycine; and proline, and wherein P5

comprises an amino acid selected from the group consisting of glutamic acid; phenylalanine; glycine; and proline, wherein the elastase-resistant ATIII is at least as resistant to elastase as plasma ATIII, wherein the ATIII retains a factor Xa inhibitory activity which is at least about 12.5 percent of plasma ATIII factor Xa inhibitory activity.

122. (Previously presented) The elastase-resistant ATIII of claim 121 wherein the ATIII further comprises three additional modifications, wherein the modifications occur at positions P6, P7, and P8 of the ATIII, wherein P6, P7, and P8 are the sixth, seventh, and eighth amino acids towards the amino terminal side of the scissile bond of the reactive center respectively, wherein P8 is glutamic acid, wherein residue P7 comprises an amino acid selected from the group consisting of glutamic acid and glutamine, and wherein P6 comprises an amino acid selected from the group consisting of: leucine; glycine; glutamic acid; and threonine.

123. (Previously presented) The elastase-resistant ATIII of claim 121 wherein the ATIII further comprises one additional modification, wherein the modification occurs at position P3 of the ATIII, wherein P3 is the third amino acid towards the amino terminal side of the scissile bond of the reactive center , and wherein P3 comprises an amino acid selected from the group consisting of isoleucine; serine; glycine; and asparagine.

124. (Currently amended) An elastase-resistant antithrombin III (ATIII) comprising at least three modifications, wherein the modifications occur at positions P4, P5, and P6 of the ATIII, wherein P4, P5, and P6 are the fourth, fifth, and sixth amino acids towards the amino terminal side of the scissile bond of the reactive center respectively, wherein P4 comprises an

amino acid selected from the group consisting of alanine; phenylalanine; glycine; and proline, wherein P5 comprises an amino acid selected from the group consisting of glutamic acid; phenylalanine; glycine; and proline, and wherein P6 comprises an amino acid selected from the group consisting of leucine, glycine, glutamic acid, and threonine, wherein the elastase-resistant ATIII is at least as resistant to elastase as plasma ATIII, wherein the ATIII retains a factor Xa inhibitory activity which is at least about 12.5 percent of plasma ATIII factor Xa inhibitory activity.

125. (Previously presented) The elastase-resistant ATIII of claim 124, wherein P6 is glycine.

126. (Previously presented) The elastase-resistant ATIII of claim 125, wherein P5 is phenylalanine or glutamic acid.

127. (Currently amended) An elastase-resistant antithrombin III (ATIII) comprising at least two modifications, wherein the modifications occur at positions P3 and P6 of the ATIII, wherein P3 and P6 are the third and sixth amino acids towards the amino terminal side of the scissile bond of the reactive center respectively, wherein P3 comprises an amino acid selected from the group consisting of isoleucine; serine; glycine; and asparagine, and wherein P6 comprises an amino acid selected from the group consisting of leucine; glycine; glutamic acid; and threonine, wherein the elastase-resistant ATIII is at least as resistant to elastase as plasma ATIII, wherein the ATIII retains a factor Xa inhibitory activity which is at least about 12.5 percent of plasma ATIII factor Xa inhibitory activity.

128. (Previously presented) The elastase-resistant ATIII of claim 127, wherein P3 is serine.

129. (Previously presented) The elastase-resistant ATIII of claim 128, wherein P6 is glycine.

130. (Previously presented) The elastase-resistant ATIII of claim 129, wherein P3 is serine.

131. (Currently amended) An elastase-resistant antithrombin III (ATIII) comprising at least three modifications, wherein the modifications occur at positions P3, P6, and P7 of the ATIII, wherein P3, P6, and P7 are the third, sixth, and seventh amino acids towards the amino terminal side of the scissile bond of the reactive center respectively, wherein P3 comprises an amino acid selected from the group consisting of isoleucine; serine; glycine; and asparagine, wherein P6 comprises an amino acid selected from the group consisting of leucine; glycine; glutamic acid; and threonine, and wherein P7 comprises an amino acid selected from the group consisting of glutamic acid and glutamine, wherein the elastase-resistant ATIII is at least as resistant to elastase as plasma ATIII, wherein the ATIII retains a factor Xa inhibitory activity which is at least about 12.5 percent of plasma ATIII factor Xa inhibitory activity.

132. (Previously presented) The elastase-resistant ATIII of claim 131, wherein P7 is glutamic acid.

133. (previously presented) The elastase-resistant ATIII of claim 132, wherein P3 is serine, and wherein P6 is glycine.

134. (Currently amended) An elastase-resistant antithrombin III (ATIII) comprising at least five amino acid modifications, wherein the modifications occur at positions P3, P4, P5, P6, and P7 of the ATIII, wherein P3, P4, P5, P6, and P7 are the third, fourth, fifth, sixth, and seventh amino acids towards the amino terminal side of the scissile bond of the reactive center respectively, wherein P3 is serine, wherein P4 is phenylalanine, wherein P5 is phenylalanine, wherein P6 is glycine, and wherein P7 is glutamic acid, wherein the elastase-resistant ATIII is at least as resistant to elastase as plasma ATIII, wherein the ATIII retains a factor Xa inhibitory activity which is at least about 12.5 percent of plasma ATIII factor Xa inhibitory activity.[.]

135. (Currently amended) An elastase-resistant antithrombin III (ATIII) comprising at least five amino acid modifications, wherein the modifications occur at positions P3, P4, P5, P6, and P7 of the ATIII, wherein P3, P4, P5, P6, and P7 are the third, fourth, fifth, sixth, and seventh amino acids towards the amino terminal side of the scissile bond of the reactive center respectively, wherein P3 is serine, wherein P4 is alanine, wherein P5 is glutamic acid, wherein P6 is glycine, and wherein P7 is glutamic acid, wherein the elastase-resistant ATIII is at least as resistant to elastase as plasma ATIII, wherein the ATIII retains a factor Xa inhibitory activity which is at least about 12.5 percent of plasma ATIII factor Xa inhibitory activity.

136. (Currently amended) An elastase-resistant antithrombin III (ATIII) comprising at least two modifications, wherein the modifications occur at positions P4 and P5 of the ATIII,

wherein P4 and P5 are the fourth and fifth amino acids towards the amino terminal side of the scissile bond of the reactive center respectively, wherein P4 comprises an amino acid selected from the group consisting of alanine; glycine; and proline, and wherein P5 comprises an amino acid selected from the group consisting of glutamic acid; glycine; and proline, wherein the elastase-resistant ATIII is at least as resistant to elastase as plasma ATIII, wherein the ATIII retains a factor Xa inhibitory activity which is at least about 12.5 percent of plasma ATIII factor Xa inhibitory activity.

137. (Currently amended). An elastase-resistant antithrombin III (ATIII) comprising at least three modifications, wherein the modifications occur at positions P4, P5, and P6 of the ATIII, wherein P4, P5, and P6 are the fourth, fifth, and sixth amino acids towards the amino terminal side of the scissile bond of the reactive center respectively, wherein P4 is alanine, wherein P5 is glutamic acid; and wherein P6 is leucine, wherein the elastase-resistant ATIII is at least as resistant to elastase as plasma ATIII, wherein the ATIII retains a factor Xa inhibitory activity which is at least about 12.5 percent of plasma ATIII factor Xa inhibitory activity.

138. (Currently amended). An elastase-resistant antithrombin III (ATIII) comprising at least four modifications, wherein the modifications occur at positions P3, P4, P5, and P6 of the ATIII, wherein P3, P4, P5, and P6 are the third, fourth, fifth, and sixth amino acids towards the amino terminal side of the scissile bond of the reactive center respectively, wherein P3 is isoleucine, wherein P4 is alanine, wherein P5 is glutamic acid; and wherein P6 is leucine, wherein the elastase-resistant ATIII is at least as resistant to elastase as plasma ATIII, wherein

the ATIII retains a factor Xa inhibitory activity which is at least about 12.5 percent of plasma ATIII factor Xa inhibitory activity.

139. (Previously presented) The ATIII of claim 121, wherein the ATIII is in a pharmaceutically acceptable formulation.

140. (Previously presented) The elastase-resistant ATIII of claim 121, wherein the ATIII has enhanced heparin binding activity.

141. (Previously presented) The ATIII of claim 140, wherein the ATIII is in a pharmaceutically acceptable formulation.

142. (Previously presented) The elastase-resistant ATIII of claim 121, wherein the ATIII has enhanced heparin binding activity, and wherein the ATIII has a mutation two residues subsequent to a glycosylation site.

143. (Previously presented) The ATIII of claim 142, wherein the ATIII is in a pharmaceutically acceptable formulation.

144. (New) An elastase-resistant antithrombin III (ATIII) comprising at least two modifications, wherein the modifications occur at positions P4 and P6 of the ATIII, wherein P4 and P6 are the fourth and sixth amino acids towards the amino terminal side of the scissile bond of the reactive center respectively, wherein P4 comprises an amino acid selected from the group consisting of alanine; phenylalanine; glycine; and proline, and wherein P6 comprises an amino

acid selected from the group consisting of leucine; glycine; glutamic acid; and threonine, wherein the elastase-resistant ATIII is at least as resistant to elastase as plasma ATIII, wherein the ATIII retains a thrombin inhibitory activity defined by a k_{app} of at least about 0.2$M^{-1}S^{-1}$ x 10^3.

145. (New) The ATIII of claim 144, wherein the P4 is alanine and P6 is leucine.

146. (New) The elastase-resistant ATIII of claim 145, wherein the ATIII has enhanced heparin binding activity, and wherein the ATIII has a mutation two residues subsequent to a glycosylation site.

147. (New) The ATIII of claim 146, wherein the ATIII is in a pharmaceutically acceptable formulation.

148. The ATIII of claim 146, wherein the glycosylation site occurs at position 135 of SEQ ID NO:35.

149. The ATIII of claim 146, wherein the glycosylation site occurs at position 192 of SEQ ID NO:35.

150. (New) An elastase-resistant antithrombin III (ATIII) comprising at least two modifications, wherein the modifications occur at positions P4 and P6 of the ATIII, wherein P4 and P6 are the fourth and sixth amino acids towards the amino terminal side of the scissile bond of the reactive center respectively, wherein P4 comprises an amino acid selected from the group consisting of alanine; phenylalanine; glycine; and proline, and wherein P6 comprises an amino

acid selected from the group consisting of leucine; glycine; glutamic acid; and threonine, wherein the elastase-resistant ATIII is at least as resistant to elastase as plasma ATIII, wherein the ATIII retains a factor Xa inhibitory activity defined by a k_{app} of at least about $0.2M^{-1}S^{-1} \times 10^3$.

151. (New) The ATIII of claim 150, wherein the P4 is alanine and P6 is leucine.

152. (New) The elastase-resistant ATIII of claim 151, wherein the ATIII has enhanced heparin binding activity, and wherein the ATIII has a mutation two residues subsequent to a glycosylation site.

153. (New) The ATIII of claim 152, wherein the ATIII is in a pharmaceutically acceptable formulation.

154. The ATIII of claim 152, wherein the glycosylation site occurs at position 135 of SEQ ID NO:35.

155. The ATIII of claim 152, wherein the glycosylation site occurs at position 155 of SEQ ID NO:35.

156. (New) An elastase-resistant antithrombin III (ATIII) comprising at least two modifications, wherein the modifications occur at positions P4 and P6 of the ATIII, wherein P4 and P6 are the fourth and sixth amino acids towards the amino terminal side of the scissile bond of the reactive center respectively, wherein P4 comprises an amino acid selected from the group consisting of alanine; phenylalanine; glycine; and proline, and wherein P6 comprises an amino

acid selected from the group consisting of leucine; glycine; glutamic acid; and threonine, wherein the elastase-resistant ATIII is at least as resistant to elastase as plasma ATIII, wherein the ATIII retains a thrombin inhibitory activity which is at least about two percent of plasma ATIII thrombin inhibitory activity.

157. (New) The ATIII of claim 156, wherein the P4 is alanine and P6 is leucine.

158. (New) The elastase-resistant ATIII of claim 157, wherein the ATIII has enhanced heparin binding activity, and wherein the ATIII has a mutation two residues subsequent to a glycosylation site.

159. (New) The ATIII of claim 158, wherein the ATIII is in a pharmaceutically acceptable formulation.

160. The ATIII of claim 158, wherein the glycosylation site occurs at position 135 of SEQ ID NO:35.

161. The ATIII of claim 158, wherein the glycosylation site occurs at position 155 of SEQ ID NO:35.

162. (New) An elastase-resistant antithrombin III (ATIII) comprising at least two modifications, wherein the modifications occur at positions P4 and P6 of the ATIII, wherein P4 and P6 are the fourth and sixth amino acids towards the amino terminal side of the scissile bond of the reactive center respectively, wherein P4 comprises an amino acid selected from the group

consisting of alanine; phenylalanine; glycine; and proline, and wherein P6 comprises an amino acid selected from the group consisting of leucine; glycine; glutamic acid; and threonine, wherein the elastase-resistant ATIII is at least as resistant to elastase as plasma ATIII, wherein the ATIII retains a factor Xa inhibitory activity which is at least about 12.5 percent of plasma ATIII factor Xa inhibitory activity.

163. (New) The ATIII of claim 162, wherein the P4 is alanine and P6 is leucine.

164. (New) The elastase-resistant ATIII of claim 163, wherein the ATIII has enhanced heparin binding activity, and wherein the ATIII has a mutation two residues subsequent to a glycosylation site.

165. (New) The ATIII of claim 164, wherein the ATIII is in a pharmaceutically acceptable formulation.

166. The ATIII of claim 164, wherein the glycosylation site occurs at position 135 of SEQ ID NO:35.

167. The ATIII of claim 164, wherein the glycosylation site occurs at position 155 of SEQ ID NO:35.

168. (New). An elastase-resistant antithrombin III (ATIII) comprising four modifications, wherein the modifications occur at positions P3, P4, P5, and P6 of the ATIII, wherein P3, P4, P5, and P6 are the third, fourth, fifth, and sixth amino acids towards the amino

terminal side of the scissile bond of the reactive center respectively, wherein P3 is isoleucine, wherein P4 alanine, wherein P5 is glutamic acid; and wherein P6 is leucine, wherein the elastase-resistant ATIII is at least as resistant to elastase as plasma ATIII, wherein the ATIII retains a thrombin inhibitory activity defined by a k_{app} of at least about $0.2M^{-1}S^{-1} \times 10^3$.

169. (New). An elastase-resistant antithrombin III (ATIII) comprising four modifications, wherein the modifications occur at positions P3, P4, P5, and P6 of the ATIII, wherein P3, P4, P5, and P6 are the third, fourth, fifth, and sixth amino acids towards the amino terminal side of the scissile bond of the reactive center respectively, wherein P3 is isoleucine, wherein P4 alanine, wherein P5 is glutamic acid; and wherein P6 is leucine, wherein the elastase-resistant ATIII is at least as resistant to elastase as plasma ATIII, wherein the ATIII retains a factor Xa inhibitory activity defined by a k_{app} of at least about $0.2M^{-1}S^{-1} \times 10^3$.

170. (New). An elastase-resistant antithrombin III (ATIII) comprising four modifications, wherein the modifications occur at positions P3, P4, P5, and P6 of the ATIII, wherein P3, P4, P5, and P6 are the third, fourth, fifth, and sixth amino acids towards the amino terminal side of the scissile bond of the reactive center respectively, wherein P3 is isoleucine, wherein P4 alanine, wherein P5 is glutamic acid; and wherein P6 is leucine, wherein the elastase-resistant ATIII is at least as resistant to elastase as plasma ATIII, wherein the ATIII retains a thrombin inhibitory activity which is at least about two percent of plasma ATIII thrombin inhibitory activity.

171. (New). An elastase-resistant antithrombin III (ATIII) comprising four modifications, wherein the modifications occur at positions P3, P4, P5, and P6 of the ATIII, wherein P3, P4, P5, and P6 are the third, fourth, fifth, and sixth amino acids towards the amino terminal side of the scissile bond of the reactive center respectively, wherein P3 is isoleucine, wherein P4 alanine, wherein P5 is glutamic acid; and wherein P6 is leucine, wherein the elastase-resistant ATIII is at least as resistant to elastase as plasma ATIII, wherein the ATIII retains a factor Xa inhibitory activity which is at least about 12.5 percent of plasma ATIII factor Xa inhibitory activity.

172. (New) The ATIII of claim 73, wherein the glycosylation site occurs at position 135 of SEQ ID NO:35.

173. (New) The ATIII of claim 73, wherein the glycosylation site occurs at position 192 of SEQ ID NO:35.

174. (New) The ATIII of claim 96, wherein the glycosylation site occurs at position 135 of SEQ ID NO:35.

175. (New) The ATIII of claim 96, wherein the glycosylation site occurs at position 192 of SEQ ID NO:35.

176. (New) The ATIII of claim 119, wherein the glycosylation site occurs at position 135 of SEQ ID NO:35.

177. (New) The ATIII of claim 119, wherein the glycosylation site occurs at position 192 of SEQ ID NO:35.

178. (New) The ATIII of claim 142, wherein the glycosylation site occurs at position 135 of SEQ ID NO:35.

179. (New) The ATIII of claim 142, wherein the glycosylation site occurs at position 192 of SEQ ID NO:35.

180. (New) The ATIII of claim 50, wherein the ATIII has enhanced heparin binding activity, and wherein the ATIII has a mutation at position 96, 135, 155, or 192 of SEQ ID NO:35.

181. (New) The ATIII of claim 75, wherein the ATIII has enhanced heparin binding activity, and wherein the ATIII has a mutation at position 96, 135, 155, or 192 of SEQ ID NO:35.

182. (New) The ATIII of claim 98, wherein the ATIII has enhanced heparin binding activity, and wherein the ATIII has a mutation at position 96, 135, 155, or 192 of SEQ ID NO:35.

183. (New) The ATIII of claim 121, wherein the ATIII has enhanced heparin binding activity, and wherein the ATIII has a mutation at position 96, 135, 155, or 192 of SEQ ID NO:35.

184. (New) The ATIII of claim 144, wherein the ATIII has enhanced heparin binding activity, and wherein the ATIII has a mutation at position 96, 135, 155, or 192 of SEQ ID NO:35.

185. (New) The ATIII of claim 150, wherein the ATIII has enhanced heparin binding activity, and wherein the ATIII has a mutation at position 96, 135, 155, or 192 of SEQ ID NO:35.

186. (New) The ATIII of claim 156, wherein the ATIII has enhanced heparin binding activity, and wherein the ATIII has a mutation at position 96, 135, 155, or 192 of SEQ ID NO:35.

187. (New) The ATIII of claim 162, wherein the ATIII has enhanced heparin binding activity, and wherein the ATIII has a mutation at position 96, 135, 155, or 192 of SEQ ID NO:35.